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Report No.: SHEM130300045303  
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# FCC MPE REPORT

<b>Application No.:</b>	SHEM1303000453RF
<b>Applicant:</b>	Lenbrook Industries Limited
<b>FCC ID:</b>	SVC-USBDAC2RX
<b>IC:</b>	152A-USBDAC2RX
<b>Equipment Under Test (EUT):</b>	
<b>NOTE:</b> The following sample(s) submitted was/were identified on behalf of the client as	
<b>EUT Name:</b>	Wireless USB DAC2
<b>Brand Name:</b>	NAD
<b>Model No:</b>	DAC 2 USB Wireless DAC Receiver
<b>Fundamental Frequency :</b>	2.4GHz Band:2412MHz-2464MHz, 5.2GHz Band:5180MHz-5240MHz, 5.8GHz Band:5736MHz-5814MHz
<b>Standards:</b>	FCC Rules 47 CFR §2.1091 FCC OET Bulletin 65 supplement C
<b>Date of Receipt:</b>	March 26, 2013
<b>Date of Test:</b>	April 07, 2013 to April 10, 2013
<b>Date of Issue:</b>	May 21, 2013
<b>Test Result :</b>	<b>PASS *</b>

\* In the configuration tested, the EUT (Equipment under test) complied with the standards specified above.



**Tony Wu**  
**E&E Section Manager**  
**SGS-CSTC (Shanghai) Co., Ltd.**

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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## 2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00	/	May 21, 2013	/	Original

<b>Authorized for issue by:</b>			
<b>Engineer</b>		Zenger Zhang _____ <b>Print Name</b>	
<b>Clerk</b>		Susie Liu _____ <b>Print Name</b>	
<b>Reviewer</b>		Keny Xu _____ <b>Print Name</b>	

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## 4 General Information

### 4.1 Client Information

<b>Applicant :</b>	Lenbrook Industries Limited
<b>Applicant Address:</b>	633 Granite Court, Pickering Ontario, Toronto L1W 3K1, Canada
<b>Manufacturer:</b>	Lenbrook Industries Limited
<b>Manufacturer Address:</b>	633 Granite Court, Pickering Ontario, Toronto L1W 3K1, Canada
<b>Factory:</b>	Hansong (Nanjing) Technology Ltd.

### 4.2 Details of E.U.T.

<b>EUT Name:</b>	Wireless USB DAC2	
<b>Brand Name:</b>	NAD	
<b>Model No:</b>	DAC 2 USB Wireless DAC Receiver	
<b>Power Supply:</b>	DC 5V	
<b>Frequency Band</b>	2.4GHz Band:2412MHz-2464MHz	
	5.2GHz Band:5180MHz-5240MHz	
	5.8GHz Band:5736MHz-5814MHz	
<b>Modulation Type:</b>	QPSK	
<b>Antenna Type:</b>	Integral antenna(Antenna Gain 2.0dBi)	
<b>Adapter:</b>	Rated Input:	AC 100V-240V 50-60Hz 0.5A
	Rated Output:	DC 5.0V 2.0A

### 4.3 Test Location

All tests were performed at SGS E&E EMC lab

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.  
No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.  
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### 4.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2015-02-22.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868 and C-4336 respectively. Date of Registration: 2012-05-29. Date of Expiry: 2015-05-28.

## 5 Test Standards and Limits

The Equipment under Test (EUT) has been tested at SGS's (own or subcontracted) laboratories.

The following table summarizes the specific reference documents such as harmonized standards or test specifications which were used for testing as SGS's (own or subcontracted) laboratories.

Identity	Document Title	Version
FCC OET Bulletin 65 supplement C	Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields	2001

In the configuration tested, the EUT complied with the standards specified above.

FCC LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

### (B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

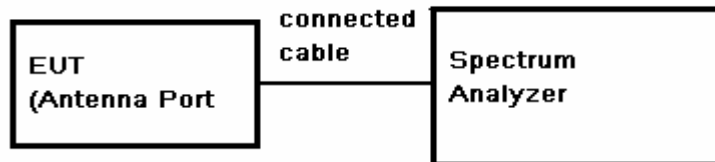
f = frequency in MHz \*Plane-wave equivalent power density

## 6 Measurement and Calculation

### 6.1 Maximum transmit power

**EUT Operation:** Test in fixing frequency operating mode at lowest, middle and highest frequency of the every working band.

**Test Configuration:**



#### Test Results

For Wi-Fi Antenna A:

Test Mode	CH	Frequency (MHz)	Reading Peak Power (dBm)	Cable Loss (dB)	Output Peak Power (dBm)	Output Peak Power (mW)
2.4GHz Band	Low	2412	14.16	1.5	15.66	36.81
	Middle	2438	13.93	1.5	15.43	34.91
	High	2464	13.46	1.5	14.99	31.55
5.8GHz Band	Low	5736	6.85	1.9	8.75	7.50
	Middle	5762	6.91	1.9	8.81	7.60
	High	5814	7.69	1.9	9.59	9.10
5.2GHz Band	Low	5180	6.61	1.9	8.51	7.10
	Middle	5210	6.05	1.9	7.95	6.24
	High	5240	4.60	1.9	6.50	4.47

For Wi-Fi Antenna B:

Test Mode	CH	Frequency (MHz)	Reading Peak Power (dBm)	Cable Loss (dB)	Output Peak Power (dBm)	Output Peak Power (mW)
2.4GHz Band	Low	2412	13.54	1.5	15.04	31.92
	Middle	2438	13.15	1.5	14.65	29.17
	High	2464	12.8	1.5	14.3	26.92
5.8GHz Band	Low	5736	6.24	1.9	8.14	6.52
	Middle	5762	7.06	1.9	8.96	7.87
	High	5814	7.08	1.9	8.98	7.91
5.2GHz Band	Low	5180	5.13	1.9	7.03	5.05
	Middle	5210	6.03	1.9	7.93	6.21
	High	5240	4.09	1.9	5.99	3.97

## 6.2 MPE Calculation

Equation from page 18 of OET 65, Edition 97-01

$$S = PG * \text{Duty factor} / 4\pi R^2$$

P = Power Input to antenna

G = Antenna Gain

R = distance to the center of radiation of antenna (in meter) = 20cm

Note:

$$1) P (\text{Watts}) = 10^{\frac{dBm}{10}} / 1000$$

$$2) G (\text{Antenna gain in numeric}) = 10^{\text{(Antenna gain in dBi / 10)}}$$

$$3) \text{MPE limit} = 1 \text{mW/cm}^2$$





Test Mode		CH	Frequency (MHz)		Antenna Gain (dBi)	R (cm)	MPE (mW/cm <sup>2</sup> )	Results
Band	Antenna							
2.4GHz Band	Antenna A	Low	2412	36.81	2.0	20	0.012	Pass
		Middle	2438	34.91	2.0	20	0.011	Pass
		High	2464	31.55	2.0	20	0.010	Pass
	Antenna B	Low	2412	31.92	2.0	20	0.010	Pass
		Middle	2438	29.17	2.0	20	0.009	Pass
		High	2464	26.92	2.0	20	0.008	Pass
5.8GHz Band	Antenna A	Low	5736	7.50	2.0	20	0.002	Pass
		Middle	5762	7.60	2.0	20	0.002	Pass
		High	5814	9.10	2.0	20	0.003	Pass
	Antenna B	Low	5736	6.52	2.0	20	0.002	Pass
		Middle	5762	7.87	2.0	20	0.002	Pass
		High	5814	7.91	2.0	20	0.002	Pass
5.2GHz Band	Antenna A	Low	5180	7.10	2.0	20	0.002	Pass
		Middle	5210	6.24	2.0	20	0.002	Pass
		High	5240	4.47	2.0	20	0.001	Pass
	Antenna B	Low	5180	5.05	2.0	20	0.001	Pass
		Middle	5210	6.21	2.0	20	0.002	Pass
		High	5240	3.97	2.0	20	0.001	Pass

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## **7 EUT Constructional Details**

Refer to the < DAC 2 \_External Photos > & < DAC 2 \_Internal Photos >.

***THE END OF REPORT***